FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM

Visit to Iowa State University: February 5th, 2019

This report summarizes the visit John D. Hooper from Magnusson Klemencic Associates (MKA) that took place at Iowa State University on February 5th, 2019.

ITINERARY OR AGENDA

Provide the itinerary of the visit. For example:

TIME:	ACTIVITY:
6:00 PM – 7:30 PM	Feb 4th: Dinner with EERI student chapter members
8:45 AM – 9:30 AM	Feb 5th: Breakfast with EERI student chapter president
9:30 AM – 10:15 AM	Structural labs tour
10:15 AM – 11:30 AM	Faculty/Graduate student met and greet
11:30 PM – 1:00 PM	Lunch
1:00 PM – 2:00 PM	Presentation plus Q&A

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S): Enrique Rubio Delgado, president, enriquer@istate.edu

- Hartanto WIbowo, Faculty, hwibowo@iastate.edu

VISITING PROFESSIONAL LECTURE OVERVIEW

Mr. Hooper's presentation dove into the aspect of engineering where a codebook cannot provide the most efficient solution. MKA, being a leader in Performance-Based Seismic Design, has taken this design approach to heart. The presentation discussed how more than the structural components, further consideration has to be taken, such as building down time, expected injuries and/or fatalities and repair costs. This sparked interest in the civil engineering graduate student community and some undergraduate; there were nearly 25 attendees.

Lecture Abstract

Performance-Based Seismic Design (PBSD) has been used for decades for the seismic retrofit of existing buildings and the design of new structures. Today's PBSD approaches focus on providing a design that typically targets one of the following performance levels for a one of several ground shaking hazard levels:

- Operational
- Immediate Occupancy
- Life Safety
- Collapse Prevention

The building code performance objective for new, ordinary (Risk Category II) buildings is to provide Life Safety for Design Earthquake (DE) ground shaking and Collapse Prevention for Maximum Considered Earthquake (MCE) ground shaking. PBSD for new buildings is typically targets performance equivalent to a code-prescriptive design. An example will be presented: used nonlinear response history analysis to fine-tune the seismic design and reduce construction costs.

The example evaluated whether the building meets in the intended performance objective of a low likelihood of collapse given MCE ground shaking. Moving beyond solely using collapse as the metric for whether a design is acceptable is the vision for the future. A FEMA-sponsored, Applied Technology Council-managed research effort has been underway for over 15 years developing the methodology. The results of this effort have been published in FEMA P-58 Seismic Performance Assessment of Buildings. The final portion of the presentation will focus on this new approach, which will allow engineers to estimate the following loss information for their buildings:

- Repair costs
- Repair time
- Unsafe placards
- Embodied energy and carbon
- Casualties

Professional Bio

John Hooper is a Senior Principal and the Director of Earthquake Engineering at Magnusson Klemencic Associates, a consulting structural and civil engineering firm in Seattle, Washington. He received his Bachelor of Civil Engineering from Seattle University and a Master of Science from the University of California at Berkeley.

John has over 30 years of engineering experience in the fields of renovation, seismic engineering, earthquake engineering, and structural analysis. He is Chair of the American Society of Civil Engineer (ASCE 7's) Seismic Subcommittee and is a member of the Main Committee, and a member of the Building Seismic Safety Council (BSSC) NEHRP Provisions Update Committee.

John has been involved in the majority of MKA's Performance-Based Seismic high-rise designs over the past 20 years and has been part of the Project Technical Committee responsible for developing the FEMA P-58 Seismic Performance Assessment of Buildings Methodology.

SUPPLEMENTAL ACTIVITES

Dinner with EERI Student members

Three undergraduate members met with Mr. Hooper for dinner at a local restaurant of Ames, IA. The goal was for the undergraduate students to have informal conversations with Mr. Hooper in regards to the job market, work-life balance, interesting projects he has worked on and more. Overall the students and Mr. Hooper seemed to have had a good and informational evening.

Structural Labs Tour

Mr. Hooper was taken on a tour of the two structural labs that are operated by the Civil Construction and Environmental Engineering department of Iowa State University. There were several ongoing projects inside the

structures labs and the lab monitors along with the graduate students in charge of those projects briefed Mr. Hooper about the project's current tasks end goals.

RESULTS, FEEDBACK AND LESSONS LEARNED

- The event was promoted by the student organization via posters and emails. However, even by these two methods a very low number of undergraduates participated in the presentation as compared to graduate students. A better method will be investigated to increase the attendance of undergraduate students for EERI student chapter's events at Iowa State University.
- The administrative side of Freidman Family Visiting Professional program was very helpful and always responded in a timely manner.

ACKNOWLEDGEMENTS

The Iowa State University EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring the travel John D. Hooper through their Friedman Family Visiting Professional Program endowment.

LIST OF ATTACHMENTS

- Item 1, Event flier.